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ABSTRACT

The stages of psychomotor development in deaf blind children and youth are reviewed, and educational principles to guide psychomotor development programs for the deaf blind are outlined. Etiological factors which contribute to the psychomotor development of deaf blind persons are discussed including nonambulation and sensory deprivation, heart conditions and cataracts, apparent lack of motivation, play stage development, and language development. Among the guidelines offered to the specialist in physical education/recreation are the following: motor development should be conceived as psychomotor in nature with focus on the unity of mind and body; psychomotor programing should begin with assessment in accordance with the regulations of P.L. 94-142 (the Education for All Handicapped Children Act); psychomotor assessment and subsequent programing should be interdisciplinary; and psychomotor training should utilize concurrently as many sense modalities as possible/feasible. Also addressed are such teaching considerations as facilities and their uses, staffing needs, and teaching needs. The J. Van Dijk/C. Sherrill Coactive Movement/Language Approach is described in terms of its six stages: resonance behavior, coactive movements, nonrepresentational reference, motor imitation, natural gesture, and language. (SBH)

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PSYCHOMOTOR DEVELOPMENT FOR THE DEAF-BLIND

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The deaf-blind child, like other multihandicapped children, benefits most from an integrated, interdisciplinary approach to physical education/recreation. In infancy and early childhood physical education/recreation may be called sensory-motor training or motor development. Regardless of its name, this training should combine language development with movement experiences. Moreover it should utilize the arts (music, dance, drama, painting, drawing, clay modeling) to stimulate the senses and enrich the movement/language learning.

Public Law 94-142 requires that every handicapped child be provided physical education as an integral part of his special education training (Federal Register: 42479). Such related services as physical therapy and occupational therapy may not lawfully be used as substitutes for physical education. Personnel from disciplines which share common goals in motor, language, and play development should, however, work closely together in assessment and educational programming of deaf-blind children.

The right to appropriate special education (including physical education) programming is guaranteed in P.L. 94-142 by the provision that each handicapped child's specially designed instruction shall evolve from an individualized education program (I.E.P.) written especially for him. Adapting the requirements of the law to the physical education portion of the I.E.P., every deaf-blind child must have in his written records:

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(1) statements concerning present levels of psychomotor performance; (2) annual physical education goals, including short term instructional objectives; (3) specific physical education content to be taught; (4) percentage of instruction to be in the mainstream; (5) dates for beginning and ending specially designed separate adapted physical education; and (6) evaluation procedures for determining the efficacy of the physical education programming (Sherrill, 1976, p. 64).

Physical education for the deaf-blind child begins, therefore, with psychomotor assessment. This task should encompass observational procedures as well as the administration of standardized developmental scales (Diebold, Curtis, and Dubose, 1978). Success in this task is largely dependent upon an understanding of the stages of psychomotor development in deaf-blind children and youth.

Psychomotor Development in Deaf-Blind Persons

Deaf-blind persons exhibit a broad constellation of psychomotor behaviors. At one end of the spectrum are persons like Robert Smithdas, who became deaf-blind at age five as the result of cerebral spinal meningitis. Smithdas offers insight into his psychomotor development by this reminiscence:

> While I was growing up, I engaged in several physical sports, including swimming, wrestling, gymnastics, skating, and horseback riding. I believe that all of these activities were beneficial for me, as they helped me to compensate for poor balance caused by my handicaps by developing muscular control and physical coordination (Smithdas, 1975).

At the other end of the spectrum are the many, many children born deaf-blind as the result of maternal rubella. These children are typically severely handicapped and motorically delayed (Robbins and Stenquist, 1967).

This paper will focus upon the severely involved deaf-blind person who may continue to function much like an infant or young child even in adulthood.

Hammer (1971) states that most deaf-blind children in educational programs today are congenitally impaired. They develop in their early years similarly to other children but their development is fragmented. He summarizes,

> ...many of these children have extensive medical problems as evidenced by medical histories of surgery and treatment. Many of these children present possible nutritional problems. Dental problems may encourage this delay in nutritional intake but there seem to be other factors. Most of these children indicate not only major sensory deficits in hearing and vision but also indicate further disabling conditions which would affect learning.

Because development is fragmented and complicated by such problems as heart malformations, cataracts, mental retardation, and cerebral palsy, deaf-blind children do not progress through describable "stages of motor development" as do normal children. It is important, therefore, to analyze contributory etiological factors in the psychomotor development of deaf-blind persons.

Nonambulation and Sensory Deprivation

The young deaf-blind rubella child is often nonambulatory. Robbins and Stenquist (1967) highlight motor development research on 28 deaf-blind children as follows:

> The average age of walking alone for three of the children with measured I.Q.s above 70 was 29 months. The fourth child in this group had a congenital malformation of the legs and did not walk until 41 months. The child with the highest I.Q. and greatest educational potential walked at 22 months; she also had a severe heart condition which

> was repaired after entrance to school....Delay in gross motor development - as evidenced by the listed ages for walking - is characteristic of this group of children.

Deaf-blind children share many of the problems of other nonambulatory children: posture deficits, immature body image, inefficient breathing patterns, low fitness, and gross sensory deprivation. Of these the gross sensory deprivation, associated with nonambulation, is the gravest in terms of lifelong consequences. Hunt (1961) was among the first educators to emphasize that the integrity of the visual-motor sensory systems predetermines the amount of learning which can be acquired during the preschool years. Bloom (1964), in a summary of over 1000 research studies, concluded that 50 percent of an individual's intelligence as measured by contemporary tests develops between conception and age four. Kephart (1962) and other perceptual-motor theorists have long contended that children delayed in learning to crawl, creep, and walk are deprived of important proprioceptive input that lends meaning to vision, audition, and touch. These findings certainly substantiate Hammer's observation that deaf-blind children "indicate further disabling conditions which would affect learning."

Heart Conditions and Cataracts

Many deaf-blind children have surgery for heart conditions and/or cataract removal during their early years. Delayed motor development can be attributed partly to such surgery and subsequent periods of convalescence.

Although some heart conditions are completely corrected surgically, the incidence of heart malfunctions among deaf-blind children remains higher than in the general handicapped population. This fact should be kept in mind when planning fitness programs, and a physician should be asked to

review proposed aerobic and/or cardiorespiratory endurance tests and training plans.

Often parental overprotection and postoperative fears are more limiting than the residual heart and/or cataract problems. Cardiorespiratory fitness is vitally important to the deaf-blind child, and goals for its gradual achievement should be set cooperatively at the I.E.P. meeting with parents and teachers.

Apparent Lack of Motivation

Many rubella deaf-blind children with the ability to walk independently do not do so. Robbins and Stenquist (1967, p. 53) describe this problem:

> Although all of the children were able to walk independently at entrance to school, the age at which they begin walking is different...Particularly outstanding are the differences in the use made of the ability to move about. The children in the below 50 Ontario I.Q. range, with S.Q.'s below 40, tended to spend most of their time lying on the floor, gazing at the light, or jiggling an object before their eyes while standing at a window. In other words, the group with I.Q.'s below 50 tends to move about very little.

This apparent lack of motivation to move and/or explore the physical environment extends to other life dimensions also. Whereas many handicapped children respond to food as a reinforcer/motivator, deaf-blind children are typically disinterested in food and display many feeding problems. Many exhibit characteristics of tactile defensiveness, i.e., they do not enjoy being touched, rubbed, stroked, fondled, or hugged. Likewise they respond negatively to new surface textures, toys with interesting "feels," and other objects/processes which might typically be used in a tactually-oriented sensorimotor stimulation program.

Many rubella deaf-blind children are described as having autistic-like

characteristics. They often seem to lack interest in people and human relationships. Self stimulatory behaviors like rocking, light gazing, and light play seem to interfere with and/or prevent benefits from training programs.

Light gazing is considered the most infantile level of development in the use of vision. Robbins and Stenquist (1967, p. 19) cite Doll (1953) in questioning the motivation of deaf-blind children in wanting to learn to use their residual sensory abilities:

> "Wanting to see" is an important, if elusive, factor in successful use of vision after cataract extractions. One of the characteristics of retarded children is lack of persistence, a lack of "wanting to know," a lack of eagerness to learn, a lack of "wanting to do" (Doll). Perhaps it is the same lack of "wanting to succeed" that prohibits some slower children from ever fully leaving the initial, passive and non-demanding level of visual stimulation.

Obviously the contributing factors in lack of motivation are many and elusive. Their role in psychomotor development, however, is primary, and the physical educator must find the specific reinforcers/rewards which best motivate/stimulate each deaf-blind child.

Play Stages And/or Development

An integral part of psychomotor development is the play stage in which the child is functioning (Sherrill, 1976, p. 53). These stages include: (1) isolated or solitary; (2) parallel; (3) interactive; (4) cooperative/shared in pairs or triads; (5) small group/formation-based games/dance; and (6) cooperative/competitive developmental sequence encompassing competition with self, with partner, and with a team.

Hammer is one of the few authorities in deaf-blind educational circles who writes about developmental stages of play. Excerpts from his writing

(1974, pp. 6-8) follow:

> Children who are deaf-blind are often observed at this level of isolated play at ages fifteen or sixteen...It is a very egocentric kind of play...There is tasting, touching, and bringing-in information at a primitive base on a physical level of toys, objects, people.
>
> Parallel play may be observed in children who are aware of other people in the world. The child seeks to do the same kinds of activities, but does not necessarily acknowledge the existence of the other person. This behavior is often observed in deaf-blind children who do the same thing but do not relate to those about them ...If the child may be observed in parallel play activities, it indicates that there has been some organization of the world and that the child has entered a time when action may be directed toward manipulating the environment.
>
> If the child demonstrates parallel play activities, it may be expected that the child will begin to engage in an interactive level of play. Interactive play may be observed as the child begins to seek out other children, adults, and situations to be part of the activities of others...Interactive play is extremely important in assessing the social system of behavior because it indicates that the child is at a level of seeking out others in the environment and is beginning to define himself in terms of his interactions with others...Children at this level initiate contact with others.

Hammer's discussion of play does not extend beyond the interactive stage which typically characterizes the play behaviors of normal four-and-five-year-olds. Most of the deaf-blind children with whom I have worked seemed to have been frozen at the isolated or solitary play stage. Clearly a major objective of psychomotor training must be progress from one developmental play stage to another.

Language Development

Movement is a form of nonverbal communication. Dancers have always recognized this and often cite a purpose of dance education and/or therapy

as helping a child with self expression. Physical educators/recreators should understand that psychomotor development is concurrently language development. One cannot/ should not exist without the other. Speech therapists, for instance, generally know a great deal about psychomotor development; they conduct programs called presymbolic training which utilize balance beams, trampolines, and other traditional physical education/recreation equipment. In working with deaf-blind children, language development (presymbolic training) should be an integral part of the psychomotor program conducted by the physical education specialist.

Educational Principles to Guide Psychomotor Development Programs for Deaf-Blind

My philosophy with regard to the education of handicapped children and youth can best be summarized as multidisciplinary/interdisciplinary/transdisciplinary (Sherrill, 1976, xvii). I see the major purposes of physical education instruction as developing leisure time competencies for richer and fuller living and as improving self concept. I believe all physical educators, as well as other motor development specialists, should have a strong background in recreation and leisure education. Likewise recreation personnel should have strong backgrounds in the neuromotor bases of movement, kinesiology, and motor development.

The following principles should guide the well rounded specialist in physical education/recreation in conducting a motor development program for deaf-blind children/youth.

1. Motor development should be conceived as psychomotor in nature with focus on the unity of mind and body. Therefore the objectives of a psychomotor

program should encompass the cognitive, affective, and psychomotor domains.

2. Psychomotor programming should begin with assessment in accordance with the regulations of P.L. 94-142 which state that: (1) more than one assessment tool must be used to collect data and (2) an individualized educational program (I.E.P.) must be written for every child.
3. Psychomotor assessment and subsequent programming should be interdisciplinary with specialists from several professions working together to interweave psychomotor development with language and play development, socialization, and improved quality of life.
4. Psychomotor development should be individualized and personalized. Precise behavioral objectives should be written for every child, and every member of the interdisciplinary team should be held accountable for showing progress toward achievement of these behavioral objectives.
5. Assessment should be continuous, with many and varied tools and processes used. Film and videotape protocol should be incorporated into assessment.
6. Emphasis should be placed upon motivation with attention given to reinforcers, rewards, etc. Behavior management techniques used in other aspects of training should be incorporated into motor development.
7. Psychomotor training should utilize concurrently as many sense modalities as possible/feasible. Remember there are 10 recognized sense modalities: vision, audition, taste, smell, touch and pressure, kinesthesis, vestibular, temperature, pain, common chemical sense (Sherrill, 1976, p. 156).
8. Psychomotor training should be humanizing, pleasurable, and joyous.

The teacher/trainer should continuously be talking to the child, smiling and using a variety of facial expressions, and communicating through body language the importance of their growing relationship.

Teaching Considerations In Carrying Out The Program

The most important consideration in conducting a psychomotor program is the ability of all staff members to work together, to share facilities, and to implement common goals for the deaf-blind child within a consistent, structured framework. To succeed, the program must be implemented at home as well as at school. Continuous inservice of one another, as well as parents, contributes to optimal use of the talents of everyone involved in psychomotor development. No activity or particular piece of equipment belongs to any one discipline.

Facilities and Their Uses

Ideally several rooms of different sizes, as well as some outdoor areas can be available for psychomotor development. Designation of space for permanent or semipermanent obstacle/challenge courses (motor circuits) prevents wasting time in putting up and taking down equipment. If several rooms can be made available, each might be planned to create a distinct sensory impression so that a child associates a certain room with particular psychomotor training. Each room should have its own distinct smell or fragrance, utilizing incense or fleural spray; its own distinct temperature; and its own distinct floor and wall textures. Body image (nonrepresentational motor work) should be done in a room of mirrors, similar to a dance studio, but with mirrors on the ceiling and floors as well as the walls. Another room might have the floor covered with mats, waterbeds, and moon walks.

Still another room might have floors and walls covered with different textures of carpeting, fabric, rubber, plastic, wood, steel, etc.

Swimming pool, trampoline, and tumbling activities are included in almost all descriptions of deaf-blind motor programs. Multipurpose apparatus like the Lind Climber, Trestle Tree Combinations, and Cargo Nets offer concrete, replicable training opportunities. Facilities, however, are less important than staff, for creative persons can do wonders with existing structures and little money.

Staffing Needs

Every deaf-blind program should have physical educators/recreators on their staffs. University transcripts and/or inservice training documentation should show evidence of strong backgrounds in motor development, kinesiology, neuromotor bases of movement, developmental play theory, and use of music, dance, drama, and art techniques to achieve psychomotor objectives. Continuous inservice training should insure understanding of specific program goals and learning activities for each child, behavior management, and total communication.

Personally I see no need for narrow specialists, persons who define themselves in terms of one discipline. I see the ideal psychomotor specialist as a blend of physical education, recreation, occupational therapy, physical therapy, and the creative arts therapies.

Teaching Needs

For the deaf-blind child, the greatest need is the integration of psychomotor and language training. All teaching should be integrated, designed to bring meaning and organization to his fragmented world. Psychomotor

training, even at the reflex level, should be conceived as inner language development. Receptive language should be encouraged by teachers/therapists who talk/sing/hum/whistle as they move limbs, who use body language consciously and continuously, whether or not the child appears to be receiving/responding. Expressive language at whatever level the child is (smiling, pointing, gesturing, demonstrating, pantomiming, signing, speaking) should be an integral part of every movement sequence/game. Thus the whole child should be involved, not just his body.

Sample Instructional Programs for Motor Development

Few physical education/recreation specialists have written specifically about motor development and/or psychomotor training for deaf-blind children: Ernie Lange, now at the University of New Mexico (1974); Louis M. Tutt, at the Michigan School for the Blind (1975); Janice K. Thomas, now at the Colorado School for the Deaf-Blind (1975); William Thomas at the Logan School in South Bend, Indiana (1975); Tom Valentine at the Pinecrest State School in Louisiana (circa 1955); Pam Earle and Gretchen Yost of Oregon (1975); Robert Mealey of Washington State School for the Blind (1975); and Garth Tymeson, now at the Texas Woman's University (1977). Their writings are mostly brief, general, and aimed largely toward the higher level ambulatory deaf-blind child. Lange and Tymeson seem to primarily emphasize fitness while the others mostly discuss motor skill development. None show the continuous integration of psychomotor and language development in which I believe.

Of the various instructional models for the deaf-blind, the one I like best is that of Van Dijk, 1966. It is generally called the Coactive Movement Approach. Dr. Van Dijk is Director of the Department for Deaf-Blind and

Aphasic Children at the School for the Deaf in St. Michelsgestil, Holland. His disciple, Leike DeLeuw, taught at the Michigan School for the Blind for several years, lectured extensively throughout the United States, and consequently greatly influenced training practices.

Tutt (1975) and Thomas (1975) both began their work at Michigan School for the Blind. These persons, although obviously exposed to the Van Dijk model, do not emphasize it in their writings. Feiber (1977) offers the most comprehensive written account I can find. In the narrative which follows, I have woven my own ideas/applications into hers.

Van Dijk/Sherrill Coactive Movement/Language Approach

The Co-active Movement Teaching Model consists of six stages: (1) resonance behavior; (2) coactive movements; (3) nonrepresentational reference; (4) motor imitation; (5) natural gesture; and (6) language. Its primary purpose is to teach language, i.e. to develop communication skills. I consider it a viable approach for physical educators/recreators which utilizes many techniques that we have always used.

Resonance Behavior

This is passively guided movement designed to achieve such objectives as: (1) beginning development of body scheme and image; (2) beginning building of anticipatory behavior; and (3) beginning building of self-help skills. The bodies of the teacher and child move as one, closely touching, in such activities as rolling, seat scooting, creeping, knee walking, or walking across the mat. Initially for seat scooting or creeping the child may be placed between the teacher's legs.

These activities may be done in a variety of environments: on mats,

waterbeds, moon walks, trampolines, on floors with carpets of various textures, in grass, even in wading pools. Knee pads should be worn by both teacher and child in extensive co-active creeping. The teacher talks/sings/hums/whistles throughout the coactive movement; the same words/phrases should be used repeatedly with movement sequences.

The child remains in this stage until the teacher senses some following and anticipating of movement. Any attempt to assist or participate in the movement is rewarded.

Coactive Movements

In this stage the child and teacher cooperatively move together with the distance between their two bodies gradually increasing. In the beginning the procedure is very structured, using the same movement patterns as in the resonance stage. The emphasis is upon teaching the child to imitate.

As the child grasps the idea of imitation, more and more activities are introduced: walking through tall grass, running down a hill, climbing over a fence, splashing through a wading pool, exploring play equipment. Van Dijk emphasizes bench routines, similar to Kephart's use of a wide balance beam, except that a board between two chairs is used. On the bench, the child imitates different ways of sitting, scooting, and eventually walking.

In this stage also practice in sequencing is begun. The teacher demonstrates increasingly longer chains of familar actions and the child imitates: sit down, scoot, stand up, and walk to textured line.

Imitation of arm positions (Sherrill, 1976, p. 167), leg positions, and different body positions is stressed. In accordance with the known progression from easy to difficult, bilateral movements are introduced first,

then unilateral, and last crosslateral. Likewise to minimize balance problems, movements are first imitated from a sitting or kneeling position.

Moving the body in relation to objects (chairs, tables, boxes, ladders, hula hoops, cage balls) is introduced in this stage also. Simple imitation games in relation to objects like "peek-a-boo" and "where did I hide the ball?" are begun.

Nonrepresentational Reference

This stage overlaps stages 2 and 4 in time and teaching in that it emphasizes recognizing body parts and learning pointing behaviors. It is a stage that prepares for more advanced imitations.

Body image activities include: (1) rubbing body parts in a meaningful situation such as dressing or bathing; (2) pointing to a body part with a touch; and (3) pointing without a touch. When learning parts of the face and other body parts not visible, a mirror is used. From pointing to one's own body parts, the imitation progression moves to pointing to someone else's body parts, to those of an animal, to those of a doll, and lastly to those in a picture. Other body awareness activities are imitated also like tracing around a body, painting and marking on body parts with shaving foam, soap suds, or other textures, and decorating body parts with stickers and ribbons.

Motor Imitation

This stage utilizes traditional perceptual-motor activities from a number of sources: Sherrill (1976, pp. 164-176); Kephart (1962); Cratty (1971); and Ayres (1972). Some of the purposes are: (1) to create generalized imitative behaviors; (2) to teach/reinforce motor planning; and (3)

to refine body perception. Increasing emphasis is placed on fine motor coordinations and hand/finger imitations with the child beginning to learn finger positions for the manual alphabet.

Levels of imitation progress from easy to difficult as follows:

> (1) The child imitates familiar movements or sounds which are visible and audible such as making an "o" with hands or vocalizing an "o"; (2) models familiar movements or sounds which are not visible and audible; (3) imitates new visible and audible models; (4) can transfer imitation to another part of the body - for example, the teacher hits the table three times with hand and the child stamps foot three times; (5) models new models not visible and audible where some trial and error is used in progressive approximation; (6) imitates new models directly; (7) defers imitation; (8) imitates pictures; and (9) imitates stick figures.[1]

From this progression, it can be deduced that "generalizing imitative behaviors" means learning to model appropriate behaviors. Robbins and Stenquist (1967, p. 101) emphasize that this stage should not be entirely tutorial. Group play activities should be used with peer and cross age models.

Dance therapists call these imitative movements "mirroring" and devote considerable time to this approach. In teaching children to generalize imitative behaviors, it is important to let each child create his own movement and have others imitate (mirror) him. Orff Schulwerk chants utilize this concept also (Moross, 1979).

Natural Gesture

Gesturing is the beginning of true representational communication. Van Dijk emphasizes that a gesture that represents an action is more meaningful that one which describes an appearance; thus a ball should be represented by the throwing action rather than circling the fingers.

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[1]The writer has edited this quotation to improve clarity; the word models has been substituted for imitates when the behavior was generalized, i,e. done from memory.

Many physical educators/recreators withdraw when the deaf-blind child reaches this stage, leaving further work to the classroom teacher and speech therapist. Peter Wisher (1979) and a growing number of dance educators, however, are utilizing gesture, pantomine, and sign in the formal teaching of dance. All of the arts offer exciting avenues for teaching/reinforcing gesture. Among the most productive are clowning, mime, puppetry, creative drama, and creative dance.

Language

In this stage the focus is usually on total communication. Physical educators/recreators who wish to work with high level deaf-blind children should be competent in the use of total communication.

Summary

Psychomotor development with deaf-blind children must be concurrently language development. It should be multidisciplinary/interdisciplinary/transdisciplinary. Sherrill's arts-oriented approach to physical education/recreation (1979) adapted to Van Dijk's Coactive Movement Teaching Model is the recommended instructional program. The end result, after several years of involvement in such instruction, should be leisure time competencies for rich, full living and good self concept.

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